

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1- 5 (canceled).

Claim 6 (currently amended): The method of ~~claim 1~~ claim 7 wherein said method is performed manually by a user or is performed automatically by routing and provisioning software.

Claim 7 (previously presented): A method for routing VT circuits in a SONET network without requiring or utilizing VT cross connections on one or more intermediate NE, and wherein the method can be performed by a single NE, comprising:

creating an STS pipe between a first NE and a second NE, said first and second NE providing VT cross connection capability, and said STS pipe traversing at least one intermediate NE; and

routing through and within said STS pipe at least one and up to 28 VT1.5 circuits between said first NE and said second NE, said VT circuits traversing said at least one intermediate NE on which VT cross connections are not utilized.

Claim 8 (previously presented): The method of claim 7 wherein said routing of said at least one VT1.5 circuit through and within said STS pipe is accomplished by the following:

inserting said VT circuit into said STS pipe at said first NE by a cross connection at said first NE; and

extracting the VT circuit from said STS pipe at said second NE by a cross connection at said second NE.

Claim 9 (previously presented): The method of claim 7 wherein the at least one intermediate node does not support or provide VT capability.

Claim 10 (original): The method of claim 7 wherein said VT circuit is a VT1.5 circuit or a larger VT circuit and said STS pipe is an STS-1 pipe or larger STS pipe, and wherein if said STS pipe is a STS-1 pipe, said STS-1 pipe being able to route up to 28 VT1.5 circuits.

Claims 11-20 (canceled).

Claim 21 (previously presented): A computer program embodied on a computer readable medium for routing Virtual Tributary (VT) circuits in a SONET network without requiring or utilizing VT cross connections on one or more intermediate Network Elements (NEs), and wherein each code segment can be stored on and executed by a single Network Element (NE), comprising:

a code segment for creating a Synchronous Transport Signal (STS) pipe between a first NE and a second NE, said first and second NE providing VT cross connection capability, and said STS pipe traversing at least one intermediate NE; and

a code segment for routing through and within said STS pipe at least one and up to 28 VT1.5 circuits between said first NE and said second NE, said at least one VT1.5 circuits traversing said at least one intermediate NE on which VT cross connections are not utilized.

Claim 22 (previously presented): The computer program of claim 21 wherein said routing of said at least one VT1.5 circuit through and within said STS pipe is accomplished by:

a code segment for inserting a VT circuit into said STS pipe at said first NE by a cross connection at said first NE; and

a code segment for extracting the VT circuit from said STS pipe at said second NE by a cross connection at said second NE.

Claim 23 (original): The computer program of claim 21 wherein said code segment for routing a VT circuit through and within said STS pipe, routes said VT circuits traversing intermediate nodes, none of which support or provide VT capability.

Claim 24 (previously presented): The computer program of claim 21 wherein said STS pipe is an STS-1 pipe.

Claims 25-29 (canceled).

Claim 30 (previously presented): A system for flexibly routing Virtual Tributary (VT) circuits over Synchronous Transport Signal (STS) circuit connections comprising:

a Network Management System (NMS) for routing one or more STS circuits and for routing VT circuits over said one or more STS circuits;

a first Network Element (NE) that supports VT cross connections and allows one or more VT circuits to be added or extracted from an STS circuit that terminates at said first NE; and

a second NE that supports VT cross connections and allows one or more VT circuits to be added or extracted from an STS circuit that terminates at said first NE wherein said NMS routes an STS circuit between said first and said second NE and said NMS routes one or more VT circuits within said STS circuit.

Claim 31 (cancelled)

Claim 32 (previously presented): The system of claim 30 wherein said STS circuit traverses one or more intermediate NE that do not provide or utilize VT cross connect capability.

Claim 33 (previously presented): The system of claim 30 wherein said routing of a VT circuit within said STS circuit is bi-directional with one VT circuit being added to said STS circuit at said first NE and extracted from said STS circuit at said second NE and another VT circuit being added to said STS circuit at said second NE and extracted from said STS circuit at said first NE.

Claim 34 (previously presented): The system of claim 30 wherein said routing said VT circuits is performed automatically by the NMS routing software or manually by a user.

Claim 35 (previously presented): A system comprising one or more Network Elements (NE) for terminating Synchronous Transport Signal (STS) pipes such that Virtual Tributary (VT) circuits can be flexibly inserted into and extracted from said terminating STS pipes, each NE comprising:

a plurality of interface cards for receiving and transmitting circuits to and from the NE respectively;

a cross connect card for cross connecting said received and transmitted circuits; and

a timing and control card (TCC) which creates one or more STS circuit terminations at the NE such that one or more VT circuits can be added to or extracted from said one or more STS circuit terminations, wherein said one or more STS circuit terminations comprises a VT ingress/egress interface VT-STs connection object (VtAdit).

Claim 36 (cancelled)

Claim 37 (previously presented): The system of claim 35 by which VT circuits are routed, over STS pipes, between said NEs by adding a VT circuit to an STS circuit termination of said one or more STS circuit terminations at a first NE and extracting the VT circuit from a said STS circuit termination at a second NE, said VT circuit being carried within an STS pipe, said STS pipe terminating at said first and second NE STS terminations.

Claim 38 (original): The system of claim 37 wherein said STS pipe traverses one or more intermediate nodes at which VT cross connections are not utilized or which do not support VT cross connections.

Claim 39 (previously presented): The system of claim 37 wherein said STS pipe is dedicated for and used to route only VT circuits and is represented as a single link between the first NE and the second NE in a VT network topology.

Claims 40-42 (canceled).

Claim 43 (currently amended): The apparatus of ~~claim 40~~ claim 44 wherein said creating of said STS circuit and routing of said VT circuit is performed manually by a user or is performed automatically by routing and provisioning software.

Claim 44 (previously presented): An apparatus for routing Virtual Tributary (VT) circuits in a SONET network without requiring or utilizing VT cross connections on one or more intermediate Network Element (NE), and wherein each of the following means is effected by a single NE, comprising:

means for creating a Synchronous Transport Signal (STS) pipe between a first NE and a second NE, said first and second NE providing VT cross connection capability, and said STS pipe traversing at least one intermediate NE; and

a means for routing through and within said STS pipe at least one and up to 28 VT1.5 circuits between said first NE and said second NE, said at least one VT1.5 circuits traversing said at least one intermediate NE on which VT cross connections are not utilized.

Claim 45 (previously presented): The apparatus of claim 44 wherein said routing of said at least one VT1.5 circuit through and within said STS pipe is accomplished by:

means for inserting a VT circuit into said STS pipe at said first NE by a cross connection at said first NE; and

means for extracting the VT circuit from said STS pipe at said second NE by a cross connection at said second NE.

Claim 46 (original): The apparatus of claim 44 wherein none of the intermediate nodes support or provide VT capability.

Claims 47-50 (canceled).

Claim 51 (new): An apparatus for routing Virtual Tributary (VT) circuits in a SONET network without requiring or utilizing VT cross connections on one or more intermediate Network Elements (NEs), and wherein code can be stored on and executed by a single Network Element (NE), comprising:

a processor; and

a memory that stores instructions for execution by said processor, said instructions comprising:

code that creates a Synchronous Transport Signal (STS) pipe between a first NE and a second NE, said first and second NE providing VT cross connection capability, and said STS pipe traversing at least one intermediate NE; and

code that routes through and within said STS pipe at least one and up to 28 VT1.5 circuits between said first NE and said second NE, said at least one VT1.5 circuits traversing said at least one intermediate NE on which VT cross connections are not utilized.

Claim 52 (new): The apparatus of claim 51 further comprising:
code that inserts a VT circuit into said STS pipe at said first NE by a cross connection at
said first NE; and
code that extracts the VT circuit from said STS pipe at said second NE by a cross
connection at said second NE.

Claim 53 (new): The apparatus of claim 51 wherein said code that routes a VT
circuit through and within said STS pipe, routes said VT circuits traversing intermediate nodes,
none of which support or provide VT capability.

Claim 54 (new): The apparatus of claim 51 wherein said STS pipe is an STS-1 pipe.